



### Case Report

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## Diaphragmatic Hernia in an isolated severe head injury patient: An accidental finding

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### Abstract

Blunt traumatic rupture of diaphragm is uncommon in an isolated severe head injury patient and usually seen in poly-trauma patients. Due to poor neurological status, diagnosis is often difficult and leads to increase in morbidity and mortality. We report a case of diaphragmatic hernia in a 25 year old male having isolated severe head injury sustained in a road traffic accident, diagnosed two days later on routine chest X-ray. Ryle's tube shadow in left lower lung field that give raise to suspicion of diaphragmatic hernia and CT scan confirms the diagnosis. A high index of suspicion is required for early diagnosis and minimizes the morbidity and mortality associated with it.

**Keywords:** Head Injury, Diaphragmatic hernia, Trauma.

### Introduction

In a severe head injury patient, isolated blunt traumatic rupture of the diaphragm (BTDR) is often difficult to diagnose<sup>[1]</sup>. In India especially in rural and suburban areas, where trauma care are in primitive stage, initial care of severely injured patients and diagnostic facilities are sub-optimal, BTDR are difficult to diagnose. It is an uncommon injury whose frequency is increasing because of the rising number of road traffic accidents and reported cases constitute only a small fraction of the problem<sup>[2-5]</sup>. We report a case of severe head injury patient, accidentally found to have left diaphragmatic hernia (congenital Vs. traumatic).

### Case Report

A 25-year old male was admitted to Trauma Intensive Care Unit (Trauma ICU) following road traffic accident (RTA), day before while travelling by bus. He sustained injury following fall from roof of a bus (sitting on roof of bus) due to sudden deceleration and sideways tilting of bus. He was semiconscious with Glasgow Coma Scale (GCS) of seven, hemodynamically stable, oxygen saturation (SpO<sub>2</sub>) 94% on room air and respiratory rate was 22/min.

Clinical examination revealed no obvious external injury except scalp hematoma at left temporo-parietal region (Figure 1). A working diagnosis of head injury was entertained. Computed tomography (CT scan) reveals multiple hemorrhagic contusions with cerebral edema in bilateral Fronto-Temporo-Occipito-Parietal lobe with scalp swelling. On 2nd day of ICU admission chest X-ray shows haziness in middle lobe of left lung field and radiopaque shadow of Ryle's tube was in left lower lung field. Continuity of left sided diaphragm cannot be delineated (Figure 2). Then suspicion of left sided diaphragmatic hernia was arises. CT scan reveals segmental contusion pneumonitis seen in left lung with pleural collection and left diaphragmatic hernia resulting herniation of stomach, bowel loops through defect, and chest wall swelling (Figure 3) and confirms the diagnosis of left sided diaphragmatic hernia.

On retrospective history, he was operated at age of 4 days for anal atresia and had repeated episodes of chest infection since childhood. This finding suggest that there was possibility of patient having congenital defect in diaphragm/congenital diaphragmatic hernia and superimposed trauma leads to further damage to diaphragm that precipitate condition more. Since patient neurological condition was poor (GCS E1M4VT), tracheostomy was done on day 3. He was weaned from ventilator on day 4 and maintaining oxygen saturation on room air/oxygen intermittently. Patient had no respiratory distress and bowel sound was present without any feature of bowel obstruction. Repair of diaphragm was not done due to poor neurological condition and managed conservatively. After 4-5 days of total parenteral nutrition, enteral feeding was started and it was well tolerated. Contusion pneumonitis resolves after 7 days.

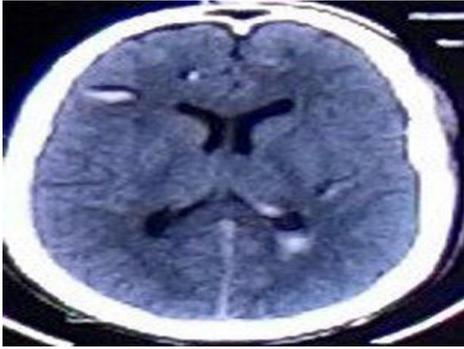
Patient neurological condition remains same, hemodynamically stable, maintaining SpO<sub>2</sub> above 95% on room air and tolerating enteral feed. Patient shifted to ward after one month of ICU stay with tracheotomy

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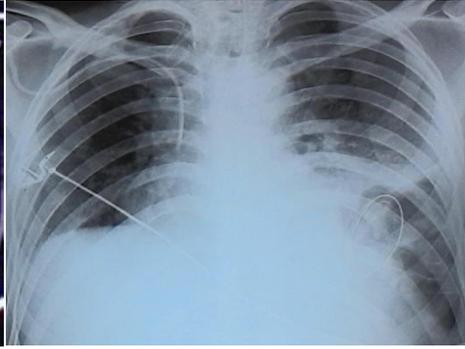
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tube in situ.



**Figure 1:** CT Head showing multiple hemorrhagic contusions with cerebral edema in bilateral Fronto-Temporo-Occipito-Parietal lobe and occipital horn of both lateral ventricles with scalp swelling.



**Figure 2:** Chest x-ray showed loss of left diaphragmatic shadow and presence of Ryle's tube in the left hemithorax.



**Figure 3:** CT chest showed left diaphragmatic herniation.

## Discussion

Road traffic accident is the foremost cause of BTDR in most reported cases [2-5]. Diaphragmatic rupture usually occurs in poly-traumatized patients but uncommon in isolated head injury patients [6,7]. Sudden rise in intra-abdominal pressure against closed glottis is the most common mechanism following blunt trauma. In India especially in rural and sub-urban area where transport facility and road condition are very poor, incidence is high. This young man was travelling on a roof of bus (because of over crowding inside bus) and sudden deceleration and sideways tilting of bus leads to thrown way from roof of bus to ground.

Our patient had isolated severe head injury, so we are not able to find any symptoms pertaining to diaphragmatic hernia like chest pain, dyspnea, vomiting, epigastric or abdominal pain etc. On auscultation bilateral air entry was present (may be due to positive pressure ventilation) and no external injury mark on left side of thorax. Mild tachypnea can be explained due to severe head injury. Accidentally Ryle's tube found coiled in lower lobe and opacity/haziness in middle lobe in left lung field in routine chest X-ray, which gives clue to possibility of diaphragmatic hernia and CT scan, confirms the finding.

On review of past history, suspicion of congenital diaphragmatic hernia (CDH) arises due to association of CDH with anal atresia and recurrent chest infection. CT scan favors the diagnosis of traumatic rupture of diaphragm due to associated ribs fracture, contusional pneumonitis and chest wall edema on same side but possibility of congenital weakness or defect in left diaphragm cannot be ruled out.

Initial chest radiograph in our patient is not very conclusive of diaphragmatic hernia because left dome of diaphragm was not delineated, clear gas shadow was not seen above diaphragm (may be due to positive pressure ventilation) and no obvious external injury mark. It was position of Ryle's tube tip, give raise to suspicion of diaphragmatic hernia. When BTDR occurs without herniation, diagnosis becomes even more difficult. Hence CT scan and magnetic resonance imaging (MRI), which yield better result than standard chest radiograph, may be necessary for diagnosis [8]. Normally acute cases are managed with laparotomy, to repair the defect and also to rule out associated intra-abdominal organ injuries. Our patient neurological condition was very poor, so repair was not done immediately.

## Conclusion

In isolated severe head injury patient BTDR is difficult to diagnose. High index of suspicion and the use of appropriate radiological investigation should result in early diagnosis and treatment of BTDR.

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